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UNSTEADY FLOW OF AN ELECTRICALLY CONDUCTING FLUID THROUGH POROUS MEDIUM WITH SUCTION

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Abstract

An unsteady two dimensional boundary layer flow with momentum transfer of a viscous incompressible and electrically conducting fluid saturated in a porous medium with suction / blowing is studied. The permeability of the medium fluctuates with time about a constant mean. The surface absorbs the fluid with constant velocity and the velocity oscillates depending on the stretching rate.
Analytical solutions for the velocity boundary layer thickness and skin friction are obtained. The velocity of the fluid is found to decrease in the presence of magnetic field and porous media. However the tangential mean flow velocity attenuates at a distance of $0(\omega/2v\sigma)^{1/2}$, where as the normal component persists even beyond this distance. It is also found that the effect of unsteadiness in the wall velocity and skin friction is found to be appreciable.
